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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,368	12/09/2003	Lawrence E. Fink	7784-000670	4398
27572	7590	06/13/2006	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			KIM, TAE JUN	
			ART UNIT	PAPER NUMBER
			3746	

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,368

Applicant(s)

FINK, LAWRENCE E.

Examiner

Ted Kim

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6,8-12,15-23 and 25-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,8-12,15-23 and 25-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/24/2006 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 12, 15, 16, 19-23, 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldberg (3,392,918) singly or in view of Schulze et al (3,266,244). Goldberg (Figs. 3, 4) teaches a nozzle for a jet engine, the nozzle comprising: a nozzle rim 23 having a flange portion 26 and an upstream interior shoulder within the nozzle rim; a convoluted bendable duct 24 having an outlet end attached to the nozzle rim adjacent the inlet shoulder, the convoluted bendable duct defining a conduit in which exhaust flow generated by the jet engine is received and delivered directly to the interior

of the nozzle rim; and at least one gimbal ring 17 pivotably coupled to supporting structure and to the flange portion 26 of the nozzle rim to allow pivoting of the nozzle rim relative to the gimbal ring about a first axis and pivoting of the nozzle rim relative to the supporting structure about a second axis for changing a vector at which the exhaust flow is discharged from the nozzle rim; wherein the first axis is generally perpendicular to the second axis; an actuation system 18, 32 for controllably pivoting the nozzle rim. A method of operating a jet engine, the method comprising: using the jet engine to generate an exhaust flow; receiving the exhaust flow in a convoluted bendable duct 24 that is attached to a nozzle rim for delivery of exhaust to a nozzle rim having a flange portion 26 pivotably coupled to supporting structure with a two-axis gimbal joint; discharging the exhaust flow from the nozzle rim; and controllably pivoting the nozzle rim to change a vector at which the exhaust flow is discharged from the nozzle rim. A method of providing a jet engine with a thrust vectoring nozzle, the method comprising: pivotably coupling a flange portion 26 of a nozzle rim to supporting structure adjacent said jet engine, with a two-axis gimbal joint; and coupling a convoluted bendable duct 24 to an inlet shoulder within the interior of the nozzle rim and the engine for receiving and delivering an exhaust flow generated by the engine to the interior of the nozzle rim. Goldberg does not mention coupling the end of convoluted bendable duct 24 within the upstream shoulder of the nozzle rim, but Goldberg does specifically teach that the connection of the bellows to the nozzle can be accomplished by any manner well known in the art (col. 1, lines 65+). Goldberg shows the adjacent bellows 25 connected to an

inside shoulder of 12. It would have been obvious to one of ordinary skill in the art to connect the convoluted bendable duct of Goldberg to the inner shoulder of the nozzle rim, in order to facilitate a strong connection and/or good sealing. Alternately, Shulze et al Fig. 4 show a flexible joint for a convoluted bendable duct 58 that is connected adjacent to an inner shoulder 64 of the nozzle 66. It would have been obvious to one of ordinary skill in the art to connect the convoluted bendable duct of Goldberg to an inner nozzle rim of Shulze et al, as an equivalent connection technique used in the art and/or to facilitate a strong assembly and/or good sealing.

4. Claims 1, 2, 6, 8-12, 15-23, 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldberg (3,392,918) singly or in view of Schulze et al (3,266,244), as applied above, and further in view of Voigt (4,892,253) and optionally Zeisloft (3,090,198). Goldberg teaches various aspects of the claimed invention but do not teach the actuation system employs yokes with arms and gear teeth. Voigt teaches that (Fig. 1) that is old and well known in the art to employ an actuation system with yokes 22 and arms 22 and gear teeth for steering the nozzle, with advantages including being shorter, lighter, easier to fabricate and better adapted for greater maneuverability (col. 1, lines 67- col. 2, line 3). It would have been obvious to one of ordinary skill in the art to employ the actuation system of Voigt, in order to take advantage of the actuation system being shorter, lighter, easier to fabricate and better adapted for greater maneuverability.

Goldberg would appear to be inherently made of materials in the claimed temperature range. However, in order to obviate any doubt, Zeisloft teaches his nozzle is made of a

material having good strength properties at a temperature of about 1800 degree Fahrenheit (note the temperature is in the range of 6000-7000 degrees, see col. 3, lines 15+) and is sufficiently inherently flexible to allow the duct to accept a degree of strain repeatedly without significant loss of strength due to fatigue from repeated bending. Alternately, it would have been obvious to make the duct sufficiently flexible to allow repeated bending without significant loss of strength due to fatigue from repeated bending in order to prevent premature failure. It would have been obvious to one of ordinary skill in the art to employ materials with high temperature resistance, in order to ensure operability and/or longevity of the rocket nozzle.

Response to Arguments

5. Applicant's arguments with respect to the claims filed 03/24/2006 have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

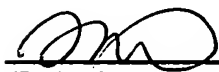
Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

Art Unit: 3746

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



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